

CLAIMS

We claim:

- 1 1. A substantially purified polynucleotide isolated from a mammal and encoding a
2 polypeptide with polyamine oxidase activity.
- 1 2. The substantially purified polynucleotide of claim 1, wherein said mammal is a human.
- 1 3. The substantially purified polynucleotide of claim 1, wherein said substantially purified
2 polynucleotide encodes an isoform or truncation of mammalian PAO.
- 1 4. The substantially purified polynucleotide of claim 1, wherein said substantially purified
2 polynucleotide is DNA.
- 1 5. The substantially purified polynucleotide of claim 1, wherein said substantially purified
2 polynucleotide is RNA.
- 1 6. The substantially purified polynucleotide of claim 4, wherein a nucleotide sequence of said
2 DNA is selected from the group consisting of SEQ ID NO. 1, SEQ ID NO.3, SEQ ID NO.5,
3 SEQ ID NO.7, SEQ ID NO.9, SEQ ID NO.11, SEQ ID NO. 13, and SEQ ID NO. 15.
- 1 7. Substantially purified polyamine oxidase isolated from a mammal.
- 1 8. The substantially purified polyamine oxidase of claim 7, wherein said mammal is a human.
- 1 9. The substantially purified polyamine oxidase of claim 7, wherein said polyamine oxidase is
2 an isoform or truncation of PAO.
- 1 10. The substantially purified polyamine oxidase of claim 7, wherein an amino acid sequence
2 of said polyamine oxidase is selected from the group consisting of SEQ ID NO. 2, SEQ ID
3 NO.4, SEQ ID NO.6, SEQ ID NO.8, SEQ ID NO.10, SEQ ID NO.12, SEQ ID NO. 14, and

4 SEQ ID NO. 16.

1 11. A vector comprising,

2 a substantially purified polynucleotide encoding a polypeptide with polyamine oxidase
3 activity isolated from a mammal, or fragment thereof.

1 12. The vector of claim 11 wherein said mammal is a human.

1 13. The vector of claim 11 wherein said isolated polynucleotide encodes an isoform or
2 truncation of mammalian PAO.

1 14. The vector of claim 11 wherein a nucleotide sequence of said isolated polynucleotide is
2 selected from the group consisting of SEQ ID NO. 1, SEQ ID NO.3, SEQ ID NO.5, SEQ ID
3 NO.7, SEQ ID NO.9, SEQ ID NO.11, SEQ ID NO. 13, and SEQ ID NO. 15 and fragments
4 thereof.

1 15. The vector of claim 11, said isolated polynucleotide encodes a polypeptide with a
2 sequence selected from the group consisting of SEQ ID NO. 2, SEQ ID NO.4, SEQ ID NO.6,
3 SEQ ID NO.8, SEQ ID NO.10, SEQ ID NO.12 SEQ ID NO. 14, and SEQ ID NO. 16, and
4 fragments thereof.

1 16. A method for detecting PAO-related DNA or RNA in a cell, comprising,
2 probing said cell with a probe, said probe comprising,
3 a substantially purified polynucleotide encoding a polypeptide with polyamine
4 oxidase activity isolated from a mammal, or isoform, truncation, or fragment
5 thereof.

1 17. A host, comprising,

2 a vector comprising a substantially purified polynucleotide encoding a polypeptide
3 with polyamine oxidase activity isolated from a mammal, or isoform, truncation, or fragment
4 thereof.

- 1 18. The host of claim 17, wherein said host is selected from the group consisting of bacteria,
2 yeast, mammalian cells, and insect cells.
- 1 19. An antibody to substantially purified polyamine oxidase isolated from a mammal, or to an
2 isoform, truncation, or fragment thereof.
- 1 20. The antibody of claim 19, wherein said antibody is polyclonal.
- 1 21. The antibody of claim 19, wherein said antibody is monoclonal
22. A diagnostic or prognostic method for evaluating a response of a tumor to an antitumor
polyamine analog, comprising the step of
detecting expression of PAOh1/SMO oxidase or a splice variant thereof in said tumor,
wherein detection of said expression indicates that said tumor is responding or will respond
favorably to treatment with said antitumor polyamine analog.
23. The method of claim 22, wherein said method is carried out prior to treatment of said
tumor with said antitumor polyamine analog.
24. The method of claim 22, wherein said method is carried out after treating said tumor with
said antitumor polyamine analog.
25. The method of claim 22, wherein said step of detecting is carried out using an antibody to
detect PAOh1/SMO oxidase or a splice variant thereof.
26. The method of claim 22, wherein said step of detecting is carried out via real time PCR
amplification to detect mRNA encoding PAOh1/SMO oxidase or a splice variant thereof.
27. A method for diagnosing a predisposition to cancer in a patient, comprising the step of
detecting expression of PAOh1/SMO oxidase or a splice variant thereof in cells of
said patient, wherein detection of said expression is associated with a predisposition to

develop cancer in said cells.

28. The method of claim 27, wherein said cells are selected from the group consisting of prostate cells, lung cells, and breast cells.

29. The method of claim 27, wherein said step of detecting is carried out using antibodies to detect PAOh1/SMO oxidase or a splice variant thereof.

30. The method of claim 27, wherein said step of detecting is carried out via real time PCR amplification to detect mRNA of PAOh1/SMO oxidase or a splice variant thereof.

31. A method of killing cancer cells, comprising the step of
inducing the production of PAOh1/SMO oxidase or a splice variant thereof in said cancer cells, wherein said step of inducing causes apoptotic cell death of said cancer cells.

32. The method of claim 31, wherein said cancer cells are solid tumor cells.

33. The method of claim 32, wherein said solid tumor cells are selected from the group consisting of lung, prostate, and breast tumor cells.

34. A transgenic mouse, wherein said transgenic mouse expresses PAOh1/SMO oxidase or a splice variant thereof.

35. The transgenic mouse of claim 34, wherein expression of PAOh1/SMO oxidase is under control of the probasin promoter.